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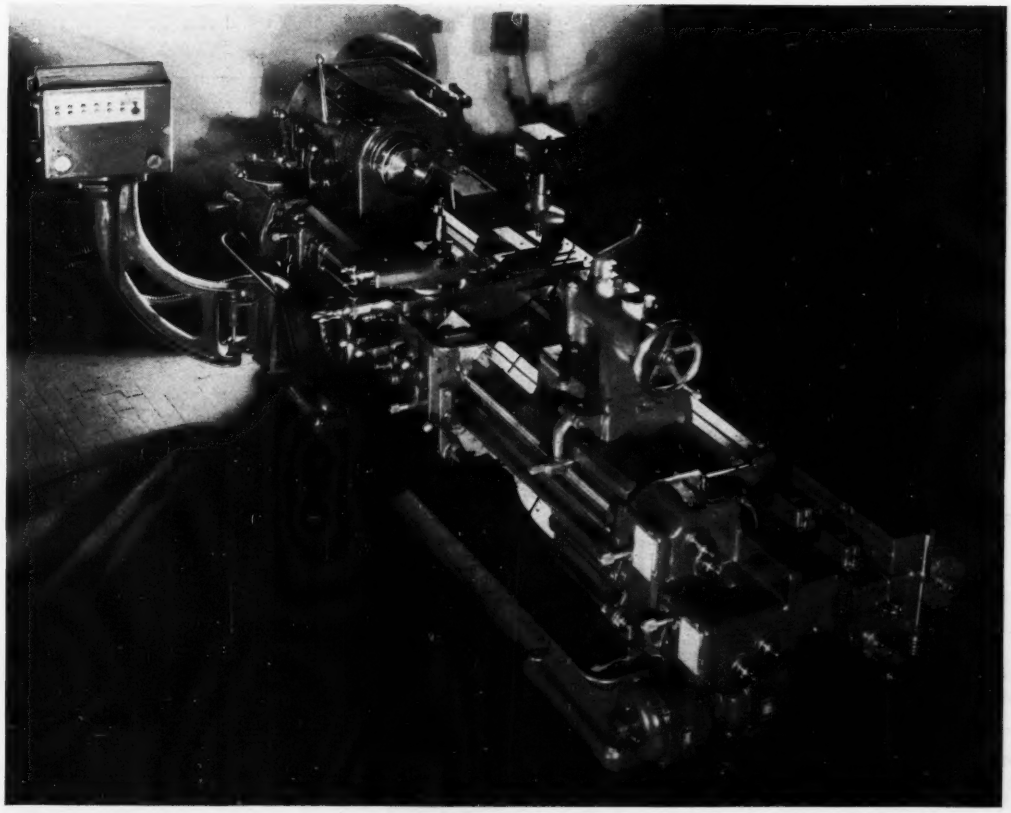
The CORNELL ENGINEER



Volume 1 DECEMBER, 1935 Number 3

In this issue: SLUM CLEARANCE *by* C. M. Chuckrow

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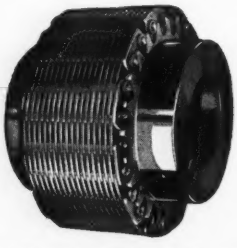

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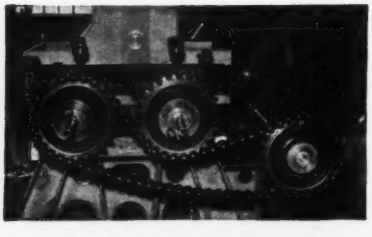

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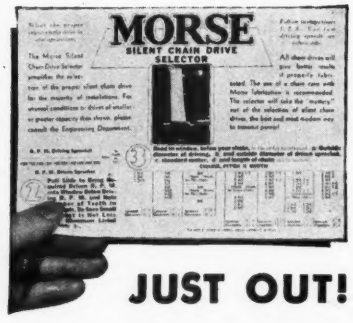

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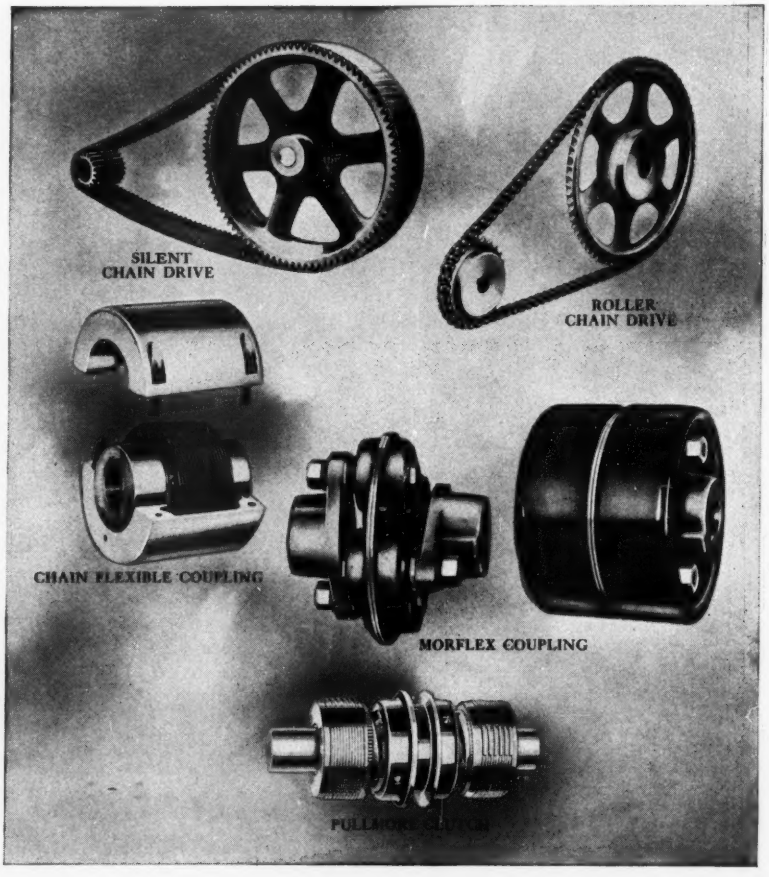

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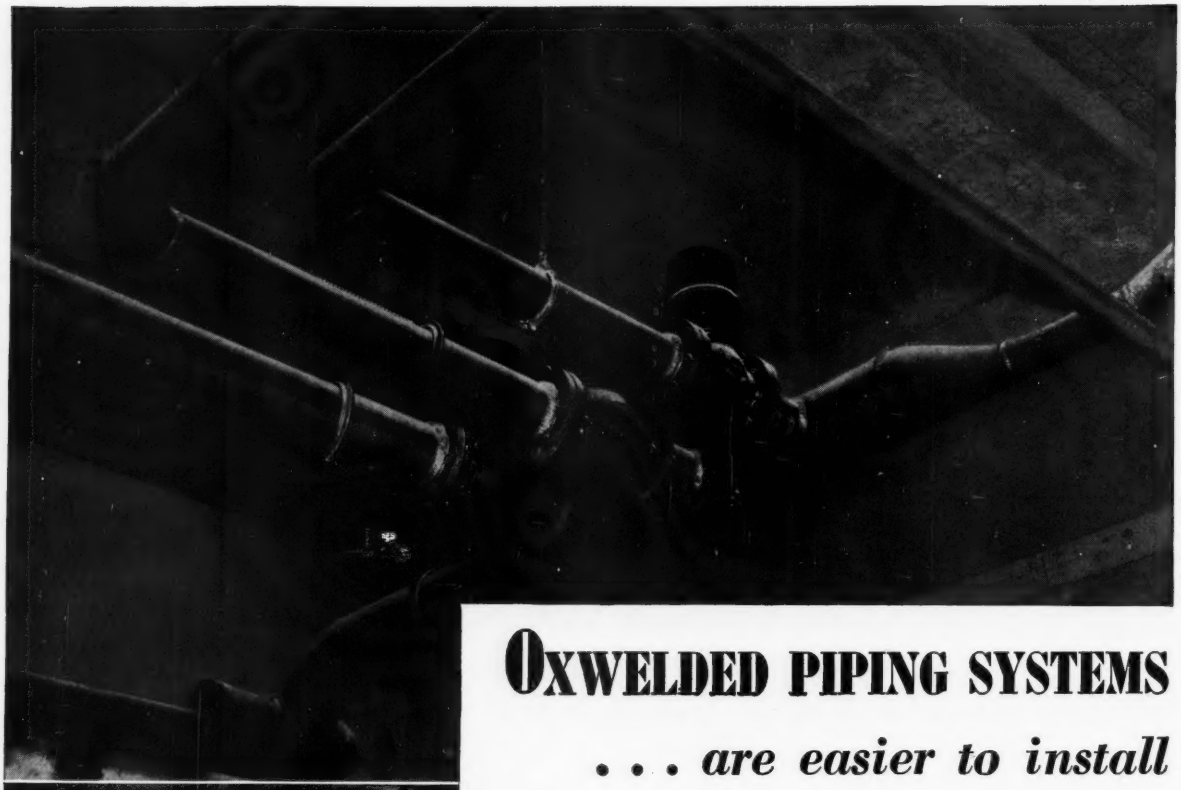

On the installation shown above, the contractor fabricated by oxy-acetylene cutting and welding the bends, reducers, and other specials in his shop and installed them with tie-in welds on the job. The lines and bends were installed with a proximity which would have been impossible by other methods of joining. The insulation contractor estimated a 30 per cent saving on insulation labor because it was a welded installation.

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Volume I **DECEMBER, 1935** **Number 3**

COMMENT

Mr. Chuckrow discusses the problem of slum clearance in New York City. This should be of especial interest since it is tied up with the proposed Wagner Housing Bill.

* * *

Professor Hedberg presents an original solution of the problem discussed in his article. The results have been used in actual design.

* * *

Mr. Philipp, a member of our Junior Board, presents the result of interviews with several faculty members who attended the Machine Tool Show.

* * *

The *"Personalities"* section, an old favorite in the *Sibley Journal* appears in the ENGINEER for the first time this month.

* * *

It seems that last month's editorial, "Get Off the Fence" has stirred up a campus controversy. An opposing viewpoint is given in a "Letter to the Editor."

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(Courtesy of Monarch Machine Tool Co.)
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CONTRAST BETWEEN OLD AND NEW BUILDINGS AT KNICKERBOCKER VILLAGE

THE CORNELL ENGINEER

Vol. I December, 1935 No. 3

Some Aspects of the Slum Clearance Problem

By C. M. Chuckrow, C.E. '11

For the past three years "Government" funds have been available for slum clearance. Actual accomplishments have been negligible. Primarily this is due to the fact that sociological ideals have taken precedence over economic realities. A proper balance between the two would have created something of permanent value to show for the vast sums otherwise spent for leaf raking and boondogling and balance is necessary in the future if the Wagner Housing Bill is to accomplish something constructive after it is enacted into law.

Government estimates show that at least six million families live in "substandard" urban homes and five million more in "substandard" farm homes—thirty-six percent of all homes lacking the basic requirements of health and decency.

Ten square miles in New York City come within the substandard classification, almost three hundred million square feet of land covered with drab, overcrowded, stinking, unsanitary tenements. The maps and charts of the "Slum Clearance Committee" 1933-34 tell the sordid story of the predominance of infant mortality, tuberculosis, dipthetria, venereal diseases, vehicular deaths, convicted felons and juvenile delinquency in these neighborhoods.

Appalling and indefensible as this is, the "social welfare" crowd were the ones who unwittingly placed obstacles in the way of even a partial amelioration of this condition. It did not seem to occur to them that a real solution of the slum problem involved sums of such magnitude that even the government could not cope with it in its entirety and that the huge appropriations of the last few years would cease with the passing of the national emergency and the necessity of balancing the budget. They thought in terms of a permanent solution of the entire slum problem and having the ear of the Administration tenaciously refused to compromise with the practical requirements necessary for real accomplishment. Allowing an extremely conservative average of $3700 to provide a home for a family (including those in multiple dwellings) and using the government estimate of 11,000,000 families indecently housed, it would require an expenditure of approximately 41 billion dollars to solve the problem. The total national debt, including accumulated deficits to date is about 30 billion dollars. To solve the problem in New York City alone would require an expenditure of five billion dollars. The government will not shower all its affection on New York City. Before an appropriation bill passes, the representatives from Iowa and Missouri and Montana see to it that they get a proper share for their constituents. New York City, having 1/8th of the nation's population, would have to wait until a grand total of 90 billions was appropriated before their slums would disappear.

Getting down to concrete cases it was demanded of a slum clearance enterprise that it be limited to four stories in height, approximately 35% land coverage, fireproof buildings, low land values, ample room sizes, cross ventilation, ample recreational and social facilities, and provide housing only for the lowest income group. Some of these conditions can and should be met; others must be modified.

Now let us apply an economic enalysis to these requirements both from the standpoint of the original PWA setup which involved a thirty percent subsidy on labor and materials, a four percent interest rate and an amortization rate of 1.51% (33 year loan), and the new PWA setup which provides for the purchase of the land by the government, leasing same to Municipal Housing Authorities and giving them a 45% grant on the cost of the building.

The construction of Knickerbocker Village—a public limited dividend housing development catering to "white collar" workers, providing accommodations for 1600 families, financed principally by RFC funds and replacing

FOUR STORY FIREPROOF WALK UP APARTMENTS
35% Coverage 100,000 square feet Land Area
Average 180 square feet per room
30% subsidy on Labor and Materials

	Land at $1 sq. ft.	Land at $2 sq. ft.	Land at $3 sq. ft.	Land at $4 sq. ft.
CAPITAL COST				
Land	$100,000	$200,000	$ 300,000	$ 400,000
Building (1,715,000 cu. ft. at 39¼c per cu. ft. including architect's and builder's fees)	673,000	673,000	673,000	673,000
Legal and mortgage expenses and interest during construction	40,000	43,000	46,000	49,000
Taxes during Construction	3,000	6,000	9,000	12,000
	816,000	922,000	1,028,000	1,134,000
Less 30% Subsidy on Labor and Materials	190,000	190,000	190,000	190,000
	$626,000	$732,000	$ 838,000	$ 944,000
ANNUAL CHARGES				
Operation and management 776 rooms at $43	$ 33,368	$ 33,368	$ 33,368	$ 33,368
*Land Taxes	2,820	5,640	8,460	11,280
Interest and amortization 5.51	34,493	40,333	46,174	52,014
	$ 70,681	$ 79,341	$ 88,002	$ 96.662
Vacancies and bad debts	3,543	3,967	4,400	4,833
	$ 74,224	$ 83,308	$ 92,402	$ 101,495
Required annual revenue per room to balance	$ 95.65	$ 107,35	$ 119.07	$ 130.79
Required monthly rental per room	$ 7.97	$ 8.94	$ 9.92	$ 10.90

*Buildings exempt from taxes.

five acres of housing on the notorius "Lung Block" declared unfit for human habitation as far back as 1901—gave Fred L. Lavanburg Foundation and Hamilton House an opportunity to develop some extremely interesting data with regard to 386 of the tenants who vacated the old premises and moved to other localities. This was published in 1933. This survey shows that before moving the average rental paid was $4.56 per room, 38% paying less than $4.00 per room. After moving these same tenants paid an average of $4.90 per room, 27% paying less than $4.00 per room. The New York Municipal Housing Authority objective is $6.00 per room. Later figures will show that this is unattainable. But even if it is attainable how can this group pay an increase of from 30% to 50% when they can just barely scrape enough together to pay their present rentals?

INTERIOR COURT OF A BUILDING IN KNICKERBOCKER VILLAGE

The above table shows the required rentals per room on land costing from $1.00 to$4.00 per square foot under the old PWA plan which formed the basis of its housing policy until the new Federal Relief Administration came into being.

This shows that with the restrictions as to heights and coverages on land costing as low as $1.00 per square foot the required rental per room would have to be $7.97 per month. This was a long way from $6.00 per room. Furthermore, $1.00 land is vacant outlying land, does not involve slum clearance and very often has such bad foundation conditions that the low price is partly neutralized. It is easy to see, therefore, why little if any slum clearance was done under that plan.

Land in slum areas in congested parts of Manhattan cannot be assembled for much less than $10.00 per square foot. Just before the Relief Bill was passed the writer approached the Chairman of the New York Municipal Housing Authority and asked him what price he could pay for land in slum areas that badly needed rehabilitation. He named a price of $6.00 per square foot. Assuming, therefore, that the powers that be would relent a little on their density of population restrictions and allow six story buildings, and taking into consideration the grant of 45%, the following figures were prepared:

(*Continued on page seventy-two*)

Longitudinal Temperature Stresses in Wash Siphons

By John Hedberg C.E. '29

Assistant Professor of Civil Engineering, Stanford University

Among the interesting structures designed for the All American Canal System are several large wash siphons that provide for the crossing of the canal by "cloudburst" flows into the Colorado River. These structures having the typical cross section as shown in Figure1, have lengths along the canal varying from 80 feet to as much as 300 feet depending on the volumes of the wash flows to be handled.

In each case the design was complicated by the exposure of the large area of the top slab to a somewhat greater temperature variation than would develop in the more sheltered bottom slab. It was estimated that as much as a 15°F. temperature difference might exist at any one time. But whatever the relative expansion or contraction of the top and bottom slabs might be, the partition walls between them must either conform to the displacements or prevent them.

It is quite apparent that the relative motion of the slabs perpendicular to the center line of the canal meets with little resistance from the partitions. Indeed it was found that their total reaction was equivalent to about ten percent of the whole displacement. On the other hand, the relative expansion or contraction of the slabs parallel to the canal meets with resistance from the partitions alone the long dimension consequently must force a shearing deformation rather than a simple bending as in the direction perpendicular. It is with this problem of longitudinal temperature stresses that this discussion is confined.

Taking the origin of x at the center of the structure, consider an element bounded by two planes perpendicular to the canal dx apart, and two planes parallel to the canal at consecutive mid spans of the partitions as shown in Figure 2(a). Due to expansion of the top slab relative to the bottom away from the center line, the element will be deformed to the shape shown in Figure 2(b). If the top slab were not connected to the partition walls the length dx would expand by the amount $k\Theta dx$, where

k = coefficient of expansion,

Θ = rise in temperature.

Since the top slab is really restrained by amounts represented by the compressive deformation at each point, we have the relationship:

$$k\Theta dx = \frac{\sigma}{E}\,dx + \frac{dv}{dx}\,dx.\,h.$$

Where σ = unit compressive stress in top slab,

v = angle of deformation of partition wall,

h = height of the partition wall.

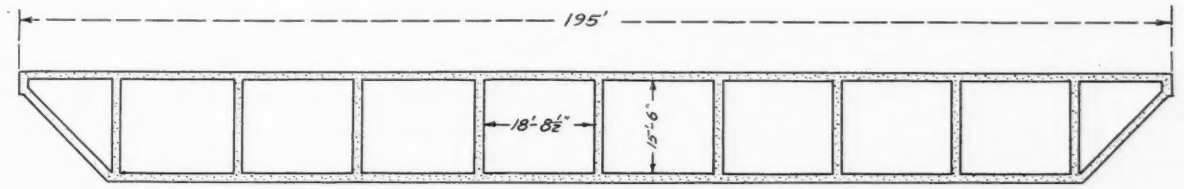
Since $v = \frac{t}{G}$, where

t = unit shearing stress

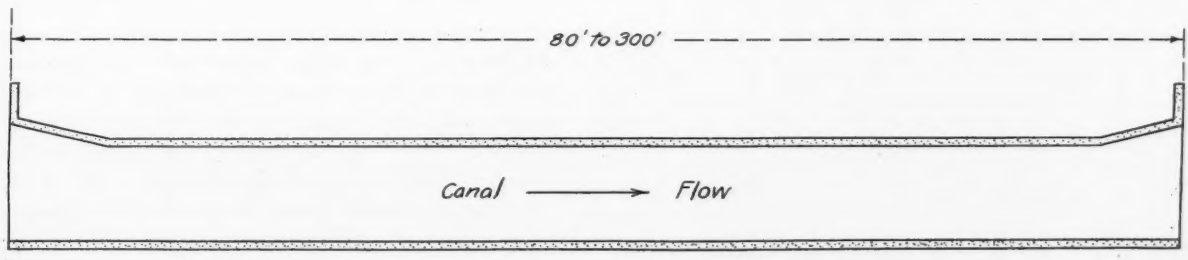
G = modulus of shear.

We have $k\Theta = \frac{\sigma}{E} + \frac{h}{G}\,\frac{dt}{dx}$ (1)

Now, if the top slab part of the element is cut away from the partition wall, as shown in Figure 3, the equilibrium equation is obtained.



TYPICAL CROSS SECTION



TYPICAL LONGITUDINAL SECTION

FIGURE 1.

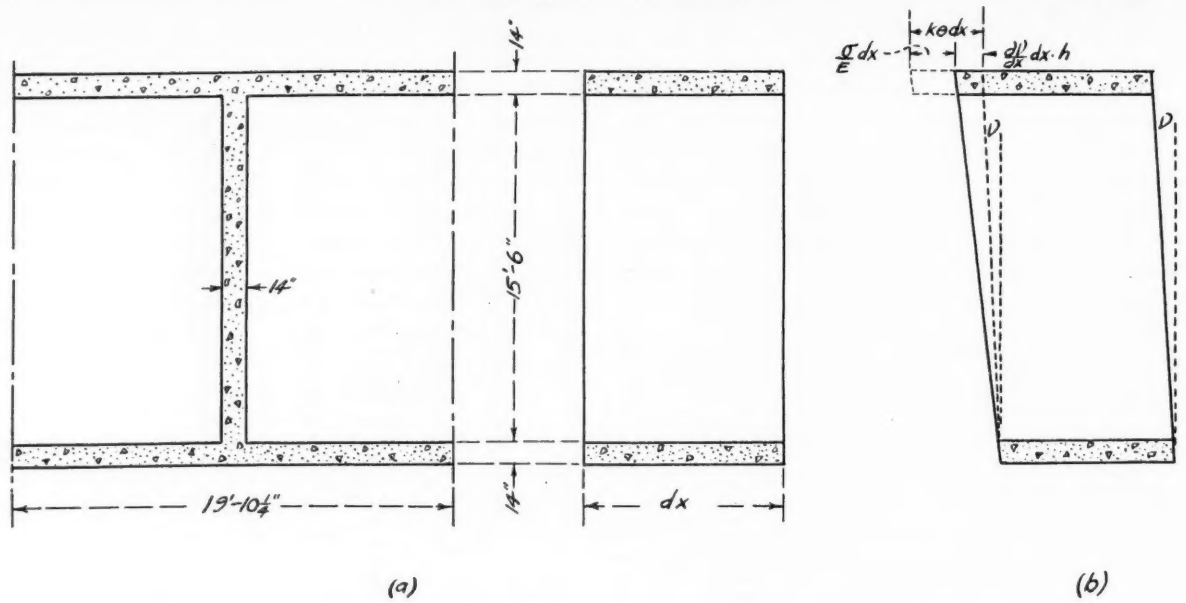


FIGURE 2.

That is: $A\ \frac{d\sigma}{dx}\,dx + t a dx = 0$ where

A = area in compression,

a = area in shear

Therefore: $t = -\frac{A}{a}\ \frac{d\sigma}{dx}$ (2).

and so: $k\Theta = \frac{\sigma}{E} - \frac{hA}{aG}\ \frac{d^2\sigma}{dx^2}$ (3).

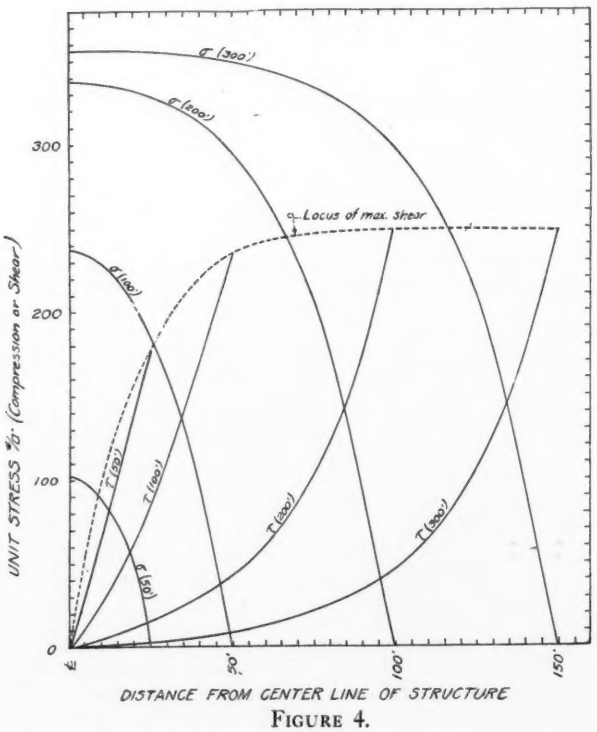


FIGURE 4.

The general solution of this equation is:

$$\sigma = Ae^{bx} + Be^{-bx} + k\Theta E.$$

where $b = \sqrt{\frac{aG}{hAE}}$

The boundary conditions are:

$\sigma = 0$, when $x = \pm l$

whence $A = B = -\frac{1}{2}\ \frac{k\Theta E}{\cosh bl}$

Therefore: $\sigma = k\Theta E\left(1 - \frac{\cosh bx}{\cosh bl}\right)$ (4).

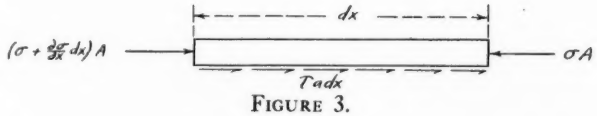


FIGURE 3.

and $t = \frac{k\Theta EAb}{a}\ \frac{\sinh bx}{\cosh bl}$ (5).

The curves for σ and t are shown in Figure 4 for the 300′, 200′, 100′, and 50′ lengths of structure. It is interesting to see that when the structure is much above 50 feet long, the maximum shearing stress and the maximum compression (or tension) remain constant. It would appear that unless expansion joints were provided at intervals of 50′ or less, they might just as well be omitted entirely. The physical significance of the results is that in the large central portion of the structure, the expansion is very nearly completely prevented while near the edges the major displacements take place. It seems reasonable then to provide heavy reinforcement for short distances from each end and furnish nominal percentages in the large central area. That is just what was done in the

(*Continued on page seventy-six*)

Highlights of the Machine Tool Show

By Gerald Philipp, '37 M.E.

That the National Machine Tool Builders Association was justified in calling their show "The World s Most Modern Machine Shop," was expressed by those who witnessed this spectacle. Several members of the faculty, who visited the show, held in Cleveland last September, returned remarking that it was all that had been advertised—and then some.

Here were gathered, under ideal conditions for exhibit purposes, about three million dollars worth of representative machines and small tools. In most cases these machines were operating on standard production jobs. Some ambitious statistician has figured out that the machinery displayed by the 238 exhibitors weighed about five million pounds. There were 235,000 square feet of exhibit area, some firms occupying up to 4000 square feet.

During the past five years, the machine tool industry has suffered along with the rest of the nation. However, they have taken advantage of this period of slack, and have made much progress in the design of their machines. Advancement in the field of metallurgy has, of course, contributed a great deal in making it possible to meet the specifications called for in these machines. Development of the cemented carbides, especially tungsten carbide, has made greater cutting speeds possible. New alloys, and improved methods of their manufacture, have made for new and better design.

The new machines showed development in many fields. One visitor would stress the development of electrical controls. Another, whose interest was in manufacturing, would tell you about the speed with which the various operation can be performed, and about the accuracy which may be attained. And so, by interviewing persons whose interests lie in different fields, one may obtain a cross-section of the show, and the advancements represented. Thus by interviewing those on the faculty who saw the show, we may obtain their impressions of this exhibition.

Professor Wells, who visited the show with Dean Kimball, was particularly impressed with the operating facilities. The centralized controls, the push buttons which caused the various feed mechanisms to operate, the magnetic clutches, and other control developments make the machines easier and safer to operate, and do their share in increasing the production speed. Professor Wells also noticed that heavy box section design was almost universal. Many of the medium size units have the appearance of heavy cases with a minimum of projecting levers and knobs. He also remarks that the manufacturers of abrasive wheels are keeping abreast of the machines by improved abrasive grain and wheel bonds. Several types of machines have been designed with diamond charged wheels for the shaping and sharpening of carbide tipped cutting tools.

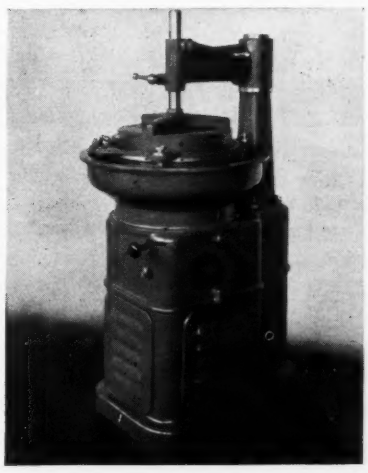
All of the faculty members interviewed were impressed with the increased speed of operation, and the great degree of precision attained. Grinders are now operated within an accuracy of 1/10,000 of an inch with comparitive ease. They remarked on the greater rigidity which the machines seemed to possess. The advancement in the use of broaching was also noticeable. Broaching is now being used for a number of operations which had previously been done on other types of machines.

Professor Rogers was interested in the design and types of bearings used. He noted that ball and roller bearings were used quite extensively. He believes, however, that the use of these bearings is due a good deal to the advertising by manufacturers of anti-friction bearings, and because of this advertising, machines equipped with these bearings would sell better. The manufacturers of plain bearings, however, state that there is still a large field for their product. Cylinders manufactured by diamond boring can be made with such accuracy, that it is found unnecessary to "break in" an automobile engine equipped with these.

The large exhibiting staff, and the number of visitors also impressed Professor Rogers. He noted the great interest shown in the exhibits, and the great amount of business which was being transacted. It seems that the show was a great boom to manufacturers of the machine tools.

Mr. Goodman saw the show from an exhibitors point of view. He worked during the summer for the Warner-Swazey company, and was one of their representatives at the show. He was kept quite busy at the Warner-Swazey exhibit, and did not get to see a good deal of the show,

(*Continued on page seventy-five*)



Courtesy Modern Machine Shop

NORTON SURFACE GRINDER

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❖ EDITORIALS ❖

We take pleasure in announcing the election of R. N. Ali '38 CE, G. C. Ehrlich '38 AE, and H. S. May '38 ME to the business board.

—o—

SIZE

There seems to be some kind of mania prevalent at the present time, which has people possessed with the idea that in order for some new project to be an outstanding accomplishment, it must be on a much larger scale than anything heretofore attempted. We hear talk of bigger airplanes, bigger ships, bigger bridges, bigger dams; we read various statistics intended to impress us with the vastness of various enterprises; with the result that the average person has come to believe that size has some mysterious power which will make the super-undertaking much better than its smaller and older rivals.

No doubt the government has had no small share in the development of this worship of bigness. In the last few years, the government has had a lot of money to spend on various projects, for the purpose of providing work, rather than for the purpose of filling some very definite need. It was easier to spend the money on a few very large enterprises, rather than on a great many smaller ones, inasmuch as the amount of work provided would be about the same in either case. Hence we have our various superprojects, which have gone a long way in creating the public's veneration for size.

It is often doubtful, however, whether or not, from an economic point of view, such an emphasis on size is entirely desirable. If the only cost of an enterprise, after its completion, were the direct operating expenses, there is no question that the bigger a project, whether it be a dam, or a bridge, or a power plant, the more desirable it would be, since usually efficiency increases with size. Unfortunately, the direct operating expenses are usually but a small fraction of the total cost of operating any enterprise. There are fixed charges, which usually amount to several times the direct expenses. These must be paid whether the enterprise is making any money or not, so that for one of these super-projects to be justified, it is essential that there be some assurance that it will be able to take in enough revenue to pay all of the fixed charges. This assurance should be something more substantial than rosy dreams of future development to come when the benefits of the project are made available, because in most cases, this development has failed to materialize. There should be some definite need, ascertained after a careful study, to fill which the project is designed and built. If great size will enable it to fill this need more satisfactorily, then a mammoth undertaking is justified; but size for size's sake is little more than insanity.

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ENGINEERING DANCE

Congratulations to the Student Council and all those connected with the Engineering Dance. At last we have a chance to meet each other and present a united front to the university as a whole on some other basis than the traditional one in which engineers are looked upon as those unshaven men in corduroys and sweaters with slipsticks projecting from various pockets. We of the Cornell Engineer have always believed that the engineers should get together on a purely social ground, and now the opportunity has arrived.

Like so many other things this enterprise is worth only what is put into it. In this case the burden of the proof is upon the students themselves. Everything that organizations can do to make the affair a success has been ably planned and executed. The success or failure depends upon the cooperation of each individual engineering student. We believe that the success will be so great that it may well become an annual affair which will be looked forward to by one and all.

CORRESPONDENCE

EDITOR'S NOTE: *The editorial, to which the following letter refers, was written by a board member, and, as with all of our editorials, is not necessarily the opinion of the board as a whole. We are willing to present all sides of a question, and it is therefore with pleasure that we print this letter. We also invite any other comments which our readers desire to make.*

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RE—GET OFF THE FENCE

TO THE EDITOR:

The editorial that appeared in this publication under the title of "Get off the Fence" was a good thought. There is no question as to whether peace is better than war and every thinking person admits this. However the fact remains that all Europe is armed to the teeth and it seems only a matter of time before the present Ethiopian struggle which is a thing of minor importance will flare up into another world conflict. Italy bitterly resents the sanctions imposed by the nations of the League and according to a late report threatens war if they are not retracted. Germany has so organized her man power that every man between the ages of 19 and 22 will receive intensive military training and be registered so that mobilization will be a mere matter of mechanics. She has admitted that her object is to be a nation under arms and this has been done in direct violation to her sworn word at the treaty of Versailles. So much for the paper contracts of nations. Italy has also lauded the Dove in the past, but she has developed formidable fangs and these cannot be ignored.

Since this is the state of affairs as they exist at the present time it seems rather foolish to talk of peace for this country thru a passive attitude. It is to be remembered that there is no power as strong as fear and that the milk of human kindness which has been so desired is getting rather chalky thruout the world at present. Therefore the policy of the "big stick" as set forth by Theodore Roosevelt can be used to great advantage at the present time. This country can have peace, but it will only get it thru strength and power. It is of no use to hide our collective heads in the sand and say that we will not fight under any circumstances. That would only provoke the sort of bullying that England engaged in against this country prior to the war of 1812 when she attacked our shipping and impressed our seamen into the British navy. We will derive no strength from weakness.

The other alternative is to arm as well as we can without sapping our resources to the point where they will be atrophied. We must have guns so much bigger and stronger than those of any other nation that no one can stand against them. We must train men to handle these guns and have a mobilization plan that is efficient enough so that we can deliver a powerful blow with the smallest waste of time. Our air force should be as strong as is possible and our navy as large and fast as we can manage. In this manner we shall be armed to a point where we can insist on peace and make our voices heard in this tomcat world with the only authority that is recognized.

This has never been the policy of our country in the past. In every war that this nation has been engaged in men have been lost because of an inadequate and inefficient policy for the emergency. Mobilization has been slow and preparations uncertain. This has meant that the enemy has been given a chance to secure a footing and therefor what might have been crushed at the outset by a single decisive blow was allowed to gather momentum to the point that in order to stop the enemy many men and much money was needlessly wasted.

This can be readily seen if the history of the Revolution, The War of 1812, the Civil War, or the World War be examined. In each of these cases the mobilization of troops and supplies was haphazard. There was centralization of neither military force nor authority.

Since the World War this has been changed somewhat. There has been organized the Reserve Officers Training Corps where college men are trained, in part at least, for the contingency. Also industry has been lined up for the manufacture of munitions and supplies for an army should the need arise. This is all in the right direction and lends strength to our country. However it is not enough. There must be a realization among the people that the army and the preparation that has been done is in the nature of peace insurance of the best kind.

Utopian idealism is very well and beautiful to speculate on but it must be remembered that man is not so very far up the ladder of evolution as he sometimes thinks. His age has been estimated at roughly 5,000,000 years according to some anthropologists while the very idea that war is bad is less than 2,000 years old. And wide acceptance of this idea is much younger than this, and present indications would seem to show that it is as yet unborn. That gives the germ of the idea that peace is a desirable thing in life of .04 per cent of the total life of the race which is a negligible quantity. It is inconcievable that all the old habits and thoughts of the race for the time before this idea sprang to life can be eradicated in so short a period. The fact that it cannot is only too apparent in the present world situation. For this reason let us respect the ideals of those who are inherently so fine that they can hold the idea of a world without war. Let us keep their ideals always in mind as a goal for which the human race will strive. However, let us not forget that we are at the present a long way from this goal and that we must fit our actions to the facts, no matter what ideals we may have.

N. A. WELCH, '36

CORNELL SOCIETY of ENGINEERS

EDWARD C. M. STAHL '13, PRESIDENT

J. D. TULLER '09, VICE PRESIDENT — S. C. HOLLISTER, VICE PRESIDENT

EDWARD B. KIRBY '25, RECORDING SECRETARY — JOHN P. SYME '26, SECRETARY AND TREASURER

"The objects of this Society are to promote the Welfare of the College of Engineering at Cornell University, its graduates and former students and to establish a closer relationship between the college and the alumni."

President's Column

December 1, 1935

Fellow Engineers:

Two invitations to our alumni to make use of THE CORNELL ENGINEER in putting their ideas and sentiments before our members have gone unheeded. Perhaps this is because the invitations were near the end of this column and few read that far. It is not for lack of interest, as plenty of discussion is going on in various sections of the country pertaining to our problems and much of it is echoed back and forth between faculty and alumni. Most of the interest is now centered on the future objectives of our College and on the possible provisions for accomplishing them. One thing nearly unanimously agreed on is that the Engineering College must have balanced and coordinated activities of undergraduate curricula, graduate work and research activity. The differences of opinion lie in where the emphasis should be placed and for which of the three activities the College should be known to the world at large. This in turn raises the question especially in the research branch as to whether it be essentially purely scientific or be in the practical application to commercial uses. There are today examples of each among the leading technical institutions. The Engineering College at Cornell in its history has passed through periods of each and has ranked foremost among institutions in each phase. It is well known that academic work has throughout its history maintained an advanced position and that undergraduate requirements in engineering continue to exceed those of all other institutions. In the face of the rise of industrial research organizations and the endowed graduate work of other colleges it has been most difficult to compete in these two fields. Outstanding leadership and ability to carry on in these two fields exist in the engineering faculty but the means to work with are wholly inadequate. These conditions must be improved and it is one of the main purposes of your Society to which its efforts will be devoted.

Ever since the relatively recent development of engineering education particularly in mechanical and electrical fields, the paradox has existed that the engineer who created the modern world has let non-technical people run it. Corrective measures in the cirrucula of technical schools have been started but they can have little immediate effect on the problems confronting us in Ithaca. The individual and combined response by loyal alumni who are proud of their heritage is necessary to find the ways and means of improving the facilities for graduate work and research projects. Among our 14,000 alumni there are many who are influential or have contacts with non-Cornellians who would welcome an opportunity to be of service to their fellowmen through the medium of our Engineering College. There are many forms in which support may be contributed particularly by our members without necessarily entailing personal financial obligations. A canvass of the engineering field for necessary research problems of a self-supporting nature and having them referred to our College for solution is one line of action that most of our members could participate in. As the existence of specific problems would be helpful as such a preliminary step the mere suggestion to our faculty of procedure would be a lead which could be followed up in an appropriate manner.

More difficult of course are the contacts which would result in the provision of funds for endowments or research but what more permanently satisfying objective could one have than strengthening the institution which educated and inspired him.

In effect, our widespread alumni group might be considered as a nerve system each member of which when opportunity afforded could respond to his local stimulus and keep the College informed of any possibilities that would be of benefit.

We Cornell engineers have continuing obligations to

(*Continued on page seventy-six*)

PERSONALITIES

ARTHUR FREDERICK GLASSER

Art didn't consider being anything but an engineer, and when he thought of engineering he had visions of bridges; so he ended up in C.E., but seems to have been sidetracked from his bridges. He is majoring in sanitary engineering, and minoring in hydraulics.

In his spare time this term, Art has been puttering around the sanitation lab. His chief activity here has something to do with the use of activated carbon, whatever that is—he wouldn't tell us.

Art Glasser

During his years at Cornell he must have emerged occassionally from Lincoln's labs., because he has an imposing list of committee memberships and such — Freshman Cap-burning Committee, and both Sophomore and Junior Smoker Committees. These last are a bit mystifying, as he doesn't smoke. He has served on the Student Council for two years, and this year is its Treasurer.

Much of Art's time has been spent rowing—on the Freshman crew, and then two years on the JV. He likes to let the wind do the work too—sailing—but sailboats have a more rolling motion than shells. There was one dreadful experience after an orgy on a new kind of sandwich—cheese, ham, baloney, and no bread. Three days later, Art could sit up and drink a little tea.

Honor societies, he thinks make you feel that you really ought to be something, and are hard to live up to. He certainly has his share—Tau Bete, the Vice Presidency of Chi Epsilon, Pyramid, the Secretaryship of Red Key, Quill and Dagger, and Crew Club.

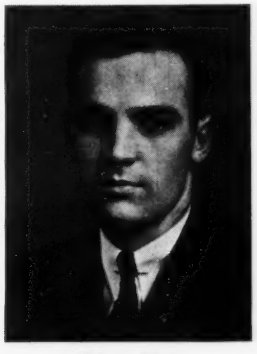
Art's interest in helping younger men is shown by his activities in the engineering camp, the C.U.R.W., and the Boy Scouts—he is Assistant Scoutmaster of an Ithaca troop. He finds time to be a president, too—of Cornell's chapter of the A.S.C.E., and of the League of Evangelical Students.

One of Art's chief interests at Cornell is the Cosmopolitan Club. After graduation, he hopes to enter the field of sanitary engineering in connection with a mission in some foreign country, perhaps in Asia.

Art is particularly outstanding in that he is a strong idealist, and has the courage to live toward his ideals.

FREDERICK DONALD HART

There have been engineers in Stroke's family since about the time when engineers were invented, and it's rumored that his first words were "log-log Duplex". At any rate, he's an engineer, and a good one; he wears a Tau Bete key. He's human, tho—leaves his mech. lab. reports until the last minute.



Don Hart

Stroke is taking the automotive option, and hopes someday to be a production manager in an automobile plant. One summer he was the third assistant engineer in a power plant—in other words, he greased things and stoked furnaces.

Stroke isn't very big, but he had an idea he'd like to row, so he presented himself at the Inlet. He's an expert swimmer and fancy diver, so his muscular coordination is very nearly perfect; still, he doesn't look like a crew man. Some one remarked, "He's too little—throw him back!" —but he kept right on rowing. One day the coach thot he'd let him try stroking the JV in a race; and the JV beat MIT, Harvard, and Syracuse. That looked pretty good, so the coach put him in the varsity; and the boat practically jumped out of the water. Since then, Cornell has had one of the best crews in the country—and the Olympic trials are coming next summer.

As steward of his fraternity, Sigma Nu; washing dishes; and waiting on table; Stroke has worked half his way thru school. He is a member of Red Key and Quill and Dagger; Vice President of Atmos; and President of the Crew Club. He served on the Freshman Advisory Committee.

The way to get along in your studies, according to Stroke, is not to cut classes. And the way to get along in life is to have self-confidence, self-respect, and respect for the other fellow. Stroke certainly has confidence—that's what it takes to walk along the railing of the bridge over Fall Creek gorge.

Stroke has built the mechanical part of a remote control radio set; and a kayak that stays afloat in heavy water. He doesn't get much of a kick out of parties; enjoys crew training; and has fun, every minute.

Stroke has resources within himself which have carried him thru troubles that would have left other men crushed. He has a fine mind, strength of character, charm—whatever it takes, he has it.

COLLEGE

A. S. M. E.

The first two meetings of the Cornell Student Branch of the A.S.M.E. this fall were attended to capacity. Last year the Cornell branch had the distinction of having the largest student membership of any school with a total of eighty eight members. This year they are well on the way to a new high with a total of one hundred and fifteen applications for membership already received, according to J. F. Hirshfeld, secretary of the society here.

At the October meeting D. C. Amsler, president of the student branch presided. Prof. Ellenwood the faculty advisor of the society made a few remarks upon the advantages of student membership. The two main speakers on the program were members of the faculty. Prof. Wells spoke on his observations at the National Machine Tool Makers Convention and show held in Cleveland early this fall. He also illustrated with slides some of the newer developments and trends in machine tool design. The second speaker on the program was Mr. Goodman who was also present at the show, working for the Warner-Swazey company. He spoke on the uses and production preformance of turret lathes. After the meeting refreshments were served and informal discussions held in the rcreation room in Sibley Dome.

At the November meeting the society was very fortunate in securing Mr. C. E. Woolson the Chief Engineer of the Chrysler Corporation as its speaker. Mr. Woolson spoke on some of the recent developments in motor car construction and illustrated his talk with slides. He particularly brought out some of the more recent advances in frame construction in theory and practice, showing that the present trend is more toward the light weight truss frame and the use of body panels as structural members. He also showed some of the testing equipment used in checking the design of a car.

It was also announced at the October meeting that the meeting of the society in January would be given over to short speeches or talks by seniors. All seniors who are interested were asked to see Prof. Ellenwood for further details. The speaker for the December meeting will be Mr. A. Dow, president of the Detroit Edison Co. Mr. Dow is one of the outstanding men in the public utilities field, and is high in the esteem of the engineering field.

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CIVIL ENGINEERS HOLD FROSH SMOKER

On Friday evening, November 22, the first Civil Engineering smoker was held in the North Room of Willard Straight Hall. H. H. Sturdy, '36, President of Rod and Bob acted as toastmaster, and the affair was sponsored jointly by Rod and Bob and Pyramid, the two honorary Civil Engineering fraternities for the purpose of affording the freshmen and upperclassmen a chance to become better acquainted.

Dean Dexter S. Kimball, guest speaker for the evening, spoke briefly on the need for closer contact between the classes, and then went on to explode a few of the myths surrounding famous mottoes of Cornell. He was followed by H. T. Jenkins, new Assistant Professor of Drawing, who made his first speech before the members of the Civil Engineering School. Professors George and Ogden then proceeded to draw upon their rich stores of memories concerning Cornell's history, and related many mirth provoking anecdotes. Professor Hollister closed the speeches with a talk on Professionalism and Patriotism in Engineering, stressing the desirability of joining the professional engineering societies.

Following the speeches, the group retired to the Straight Grill, to cement new formed friendships over coffee and sandwiches. It is planned to make the smoker an annual event.

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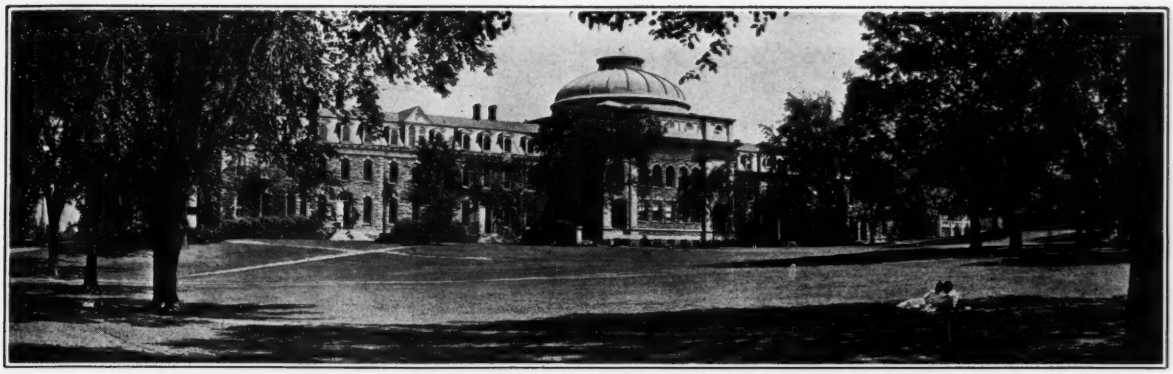
ETA KAPPA NU

The following men have recently been elected to Eta Kappa Nu, national honorary society in Electrical Engineering: D. C. Baum '36, C. Bellows '36, J. M. Condren '36, E. S. Acton '37, L. D. Culp '37, A. C. Ekvall '37, R. W. Kunkle '37, M. T. MacMahon '37, D. M. Smith '37.

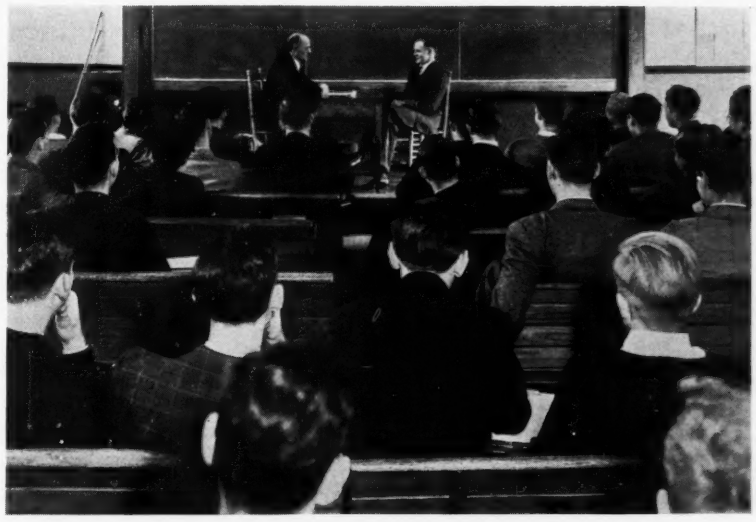


NOTES

DAVIS CONDUCTS DEMONSTRATION INTERVIEW

At a meeting of the "Introduction to Business Course" early last month, Howard L. Davis, personnel official for the New York Telephone Company, staged a demonstration of interviewing, for the purpose of obtaining jobs after graduation.

This course, was instituted five years ago under the tutelege of Professor Herman Diederichs and Professor John R. Bangs for the purpose of helping the Sibley and Franklin Seniors prepare for the business of job hunting. It teaches men to sell themselves by presenting demonstrations and visiting speakers on topics which strive to prepare the graduates and show them ahead of time what is coming.



Courtesy of the Alumni News

A Demonstration Interview

In this particular demonstration three students were called from the audience, having been previously warned, and in order, three interviews were given. In each case Davis through his friendly, yet coldly analytical manner, broke down the selling points of the student, showing where his case was poorly presented.

Points that Davis brought out in particular were: the necessity of the man selling himself, for if he doesn't, says Davis, "He is a purchasing agent, and since employers are purchasing agents these days, when two purchasing agents get together, . . . there is little prospect of a sale." He also noted the importance of each man finding his own individual niche, to begin with.

Other topics covered by Mr. Davis this fall were: "Selection of a Job," "Securing Employment," "Attitude Toward Your Job and Supervisor," and "Plan Your Own Future."

ANNOUNCEMENT OF DINNER TO JIM LYNAH ME '05

On Thursday, January 16, 1936, The Cornell Society of Engineers will join with the Cornell Club of New York in participating in a Testimonial Dinner to Jim Lynah '05, our new Athletic Director. This we are very happy to do because he is one of our outstanding engineering alumni and has unselfishly given much time and energy in the interests of the Engineering College. In accepting the Directorship of Athletics he made a great sacrifice and undertook the task only because of his high sense of duty and loyalty to Cornell.

Notice covering the detailed arrangements will be sent out early in January.

ALUMNI NOTES

'00 CE—John C. Trautwine, 3rd, editor of Trautwine's Civil Engineers Reference Book, has moved the headquarters of his enterprise from Philadelphia, Pa., to Ithaca, where he now resides.

'08 ME—Elmer J. Booth was a recent visitor in Ithaca. He is in the lumber business in Wiergate, Texas.

'09 ME—Frederic O. Ebeling is an employee of the United States Internal Revenue Service at the Joseph E. Seagram and Sons distillery at Lawrenceburg, Indiana. His address there is % R. C. Elliott, 27 Probasco Street. His permanent address is 1125 Davis Street, Evanston, Ill. He has one daughter at Rockford College, and another at Grinnell College.

'10 ME—Frank R. Oates is vice-president of Technicolor Motion Pictures Corporation, of Los Angeles, California. He plans to go to London to be managing technical director of his company's subsidiary, Technicolor, Ltd.

'11 ME—Alexander J. Heidt is Secretary of the newly organized Realty Owners and Agents League, of New York City.

'11 ME—Edwin H. Atwood is general refinery manager for the Socony-Vacuum Oil Company in Eastern Europe. Most of his work is centered in France and Italy. His address is 46 Rue de Courcelles, Paris, France. His son is Hugh M. Atwood, '38.

'11 ME—Thomas Midgley, Jr., research investigator for the General Motors Corporation, has just developed a new refrigerant, di-chlor-di-fluoro-methane. It is non-poisonous, and is reputed to be one of the best refrigerants yet discovered.

'11 ME—Munroe F. Warner has opened offices at 31 Clinton Street, Newark, New Jersey, for the general practice of engineering in the chemical and metallurgical industries, and for the distribution of refrigeration air conditioning equipment.

'11 ME; '15 MME—Herbert B. Reynolds, mechanical engineer for the Interborough Rapid Transit Company, is the author of an article which appeared in the October issue of "Power", entitled "Seven Million Dollars Saved." It deals with the methods used to improve the operating economy of the power stations supplying the rapid transit lines in New York City.

'12 ME—J. Paul Leinroth is general industrial fuel representative for the Public Service Electric and Gas Company of Newark, New Jersey. He lives at 37 The Farway, Montclair, New Jersey.

'12 CE—Max Grossman, proprietor of Grossman's Hotel, Atlantic City, New Jersey, has been elected chairman of the New Jersey State Water Policy Commission.

'12 ME—Alan C. Towers is in South America, where he is with the Cia. Sud Americana de Servicios Publicos, Calle Corrientes 222, Buenos Aires, Argentina. He has four children.

'12 ME—Karl W. Gass is chief engineer for the Amster-Morton Company, engineers and contractors, 702 Fulton Building, Pittsburgh, Pennsylvania. His home in Pittsburgh is at 5512 Beverly Place.

'13 ME—E. Lysle Aschaffenburg is secretary of the Cornell Club of Louisiana, and also is president of the Pontchartrain Hotel, in New Orleans. He has a son who is planning to enter the university in the class of '41.

'13 ME—Edmund W. Butler has been appointed vice-president in charge of the Brooklyn office of Triboro Agency, Inc., an insurance organization. His office is at 150 Montague Street, Brooklyn. He is also the alumni member of the advisory committee on football recently announced by the athletic policy board.

'14 ME—J. Carleton Ward, Jr., is assistant general manager of the Pratt and Whitney Aircraft Company. He lives at Mountain Road and High Street, Farmington, Conn. He has a son who intends to enter the university next year.

'15 EE—Ira E. Cole is a member of the technical staff of the Bell Telephone Laboratories, Inc., 180 Varick Street, New York City. He lives in Montclair, New Jersey, at 15 Columbus Avenue.

'16 ME—John S. Hofmyer is with the Johns Manville Corporation as District Representative of the area including Ithaca.

'20 CE—David G. Nethercot is vice-president and general manager of the Western Rosin and Turpentine Corporation, 6512 Palmer Avenue, Detroit, Michigan. He is also president of the Dill-Hough Company, St. Louis, Missouri, and vice-president of the Western Oil and Turpentine Company, Grand Rapids, Michigan. He lives in Detroit.

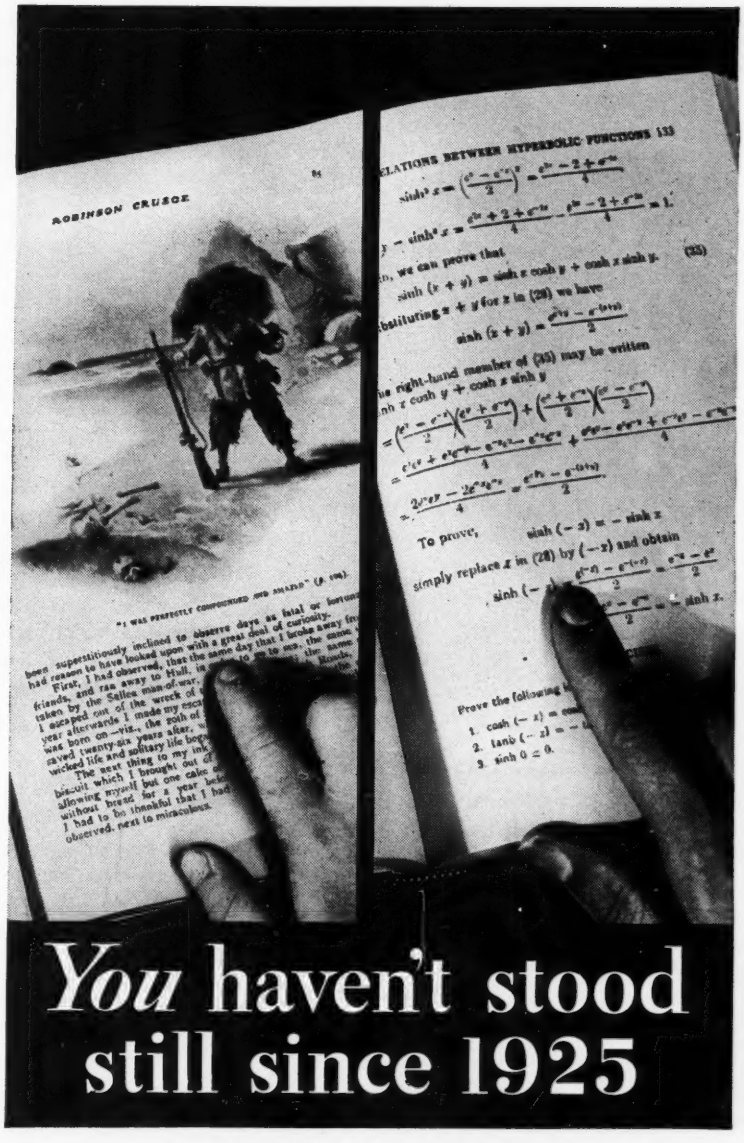
'20 CE—Thomas D. Finn has returned to his home in Exeter, New Hampshire, after having spent two years on engineering projects in San Salvador and British Honduras.

'21 ME—John R. Bangs Jr., has just completed the first chapter of his biography of Jack Moakley. This will appear in the Alumni News in a future issue.

'24 ME—Henry G. Warnick is traffic Supervisor of the Bronx-Westchester area for the New York Telephone Company. He has a daughter born last April. He lives at 52 Holls Terrace, South Yonkers.

'25 ME—Vincent L. Kohl of 1710 West Garfield Boulevard, Chicago, Illinois, is statistics engineer for the Commonwelath Edison Company.

(*Continued on page seventy*)



. . . *neither have we*

YOU have made great progress in the past 10 years, in your reading and your study. Now let's see *some* of the things the Bell System has been doing in that time.

Since 1925, we've cut the average time for completing Long Distance connections from 7½ to 1½ minutes. We've made the service more immune to weather—94% of our wires are now in cable. We've increased the telephone's scope about 80%—you can now reach nearly 31,000,000 telephones, in every quarter of the globe.

The *next* 10 year period may bring equally important advances. That is one of the ever-present thrills in telephone work!

See for yourself how fast you can "go home" by telephone. Bargain rates on station-to-station calls after 7 P. M.

BELL TELEPHONE SYSTEM

Alumni Notes

(*Continued from page sixty-eight*)

'25 ME—Guy T. Warfield Jr., is vice-president of Warfield-Dorsey Company Insurance brokers, 904 First National Bank Building, Baltimore, Md.

'26 ME—Ralph H. Rector is superintendent of the Pacific Hard Rubber Company and Western Molded Products. He has two daughters, the second born August 15. He lives at 2229 West Seventy-eighth Street, Inglewood, California.

'26 CE—C. Orville Briddell is payroll and labor supervisor of the Chesapeake and Potomac Telephone Company of Baltimore, Maryland, and also president of the C. E. Briddell Company, Inc. His daughter has just celebrated her first birthday. The Briddells live at 320 East Joppa Road, Towson, Maryland.

'26 CE—Norman R. Steinmetz is vice-president and secretary of the General Public Service Corporation. His address is 33-04 210th Street, Bayside.

'26 CE—Our congratulations to Walter W. Buckley and Mrs. Buckley. They have a daughter, born October 29. They live at 6398 Drexel Road, Overbrook, Philadelphia, Pennsylvania.

'27 CE—Arthur S. Pearson is an inspector in the civil engineering department of the New York Edison Company. He has a daughter, born July 19. He lives at 710 Warburton Avenue, Yonkers, New York.

'27 ME—Robert D. Hobbie is employed by the Lovell Dressel Company, Inc., Arlington, New Jersey. He has a new daughter, born August 16. He lives at 165 Franklin Street, Bloomfield, New Jersey.

'30 ME—Leslie E. Herbert is a mechanical engineer in the plants department of the munitions division of the Chemical Warfare Service, Edgewood Arsenal, Maryland. His address is 806 East North Avenue, Baltimore.

'30 ME—J. P. Tattersfield is in Tampico Tamps, Mexico, working for Cia Mexicana de Petroleo El Aguila which is a subsidiary of the Shell group. He is doing construction and maintenance work in the engineering department.

'30 ME—John D. Lyall is working for the Behr Manning Corporation in Watunliet, N. Y.

'31 ME—Albert R. Erda is a brewing technologist for Schwarz Laboratories, Inc., of New York City. He lives in New York at 25 Prospect Place.

'31 ME—Robert L. Gibson has just entered a training course with the Pan American Airways at Miami, Florida. This training will lead to pilot on transatlantic plane service which is expected to start in about two years.

'31 EE—Clair O. Dean is a sales engineer for McCarthy Brothers and Ford, Buffalo. He lives at 46 North End Avenue, Kenmore.

'31 EE—Walter N. Whitney is in the plant engineering department of the Delco-Remy Corporation, Anderson, Indiana.

'32 ME—John L. Conneley is employed by the American Gas Association. He lives at 2584 Exter Road, Cleveland Heights, Ohio.

'32 ME—William A. Eadie, Jr., is working in the mechanical department of the Atlantic Refining Company. His address is Yeadon, Pa.

'32 ME; '33 EE—William P. Beyerle is a test engineer with the Glenn L. Martin Aircraft Corporation, and lives at 4008 Dorchester Road, Baltimore, Maryland.

'32 ME—James E. Kane, Jr., is employed in Baltimore by the Consolidated Gas and Electric Company. He lives at 3707 Yosemite Avenue.

'32 ME—One of our recent visitors was William G. Nelson. He said that he is working in Bayonne, New Jersey, for the Tidewater Oil Company, in their refinery there. He was married this summer to an Ithaca girl. He says that his brother, Roy E. Nelson, EE '32, is also married, and is working in the RCA laboratories at Harrison, N. J.

'32 ME—George H. Stelljes was married in Ridgewood, New Jersey, October 12, to Charlotte B. Elliott, a New York University graduate. They will live in Glen Rock, New Jersey.

'32 ME—Allan R. Greene is test engineer in charge of pump inspection and maintenance for the Point Breeze plant of the Atlantic Refining Company. His address is 2532 South Twenty-second Street, Philadelphia, Pennsylvania.

'33 ME—Peter E. Kyle is still with the Massachusetts Institute of Technology where he is teaching and doing research work in metals and metal working. At the same time he is studying for an advanced degree.

'33 ME—Louis L. Otto is working for the U. S. Gypsum Company at Oakfield. His address there is P. O. Box 103.

'34 EE—Stephen A. Voelker is taking a training course with Westinghouse which will lead to the selling of air conditioning units.

'34 AE—Delbert P. Rose is a salesman of mining equipment for the General Machinery and Supply Company of Pittsburgh, Kansas.

'34 EE—Frederick W. Fink is a research fellow in electrical engineering at Cambridge University, Cambridge, England. His address there is St. John's College.

'34 CE—E. Laurence Burrows is employed in the engineering department of the American Sheet Metal and Tin Plate Company, a subsidiary of the United States Steel Corporation, at Pittsburgh, Pennsylvania. His address there is 238 South Negley Avenue.

STRESS and STRAIN

Paronomastic Prof. Strong (don't shoot, professor—look it up in Webster) went berserk in a recent assignment to the juniors in e. theory. The unabridged assignment follows:

STUDY QUESTIONS 9B
Do Nov. 28

1. Why is Turkey devastated without interference from the Legal Rations on this day?

2. What is the direction of force generated on current sauce moving normal to the magnetic flux of vision? Does the right hand rule?

3. How may overload be detected and corrected?

4. Why does an over-confounded masticator have a rising load characteristic?

5. In case of sparking at the busses what can be done to improve commutation (to or from)?

6. Why does an increase of mass cause a disproportionate increase in the inertia of the prudent body after as compared to before Thanksgiving Vaccination?

* * *

Maybe you've heard this story, but it's one that will bear repitition. We gipped it from the *California Engineer.*

A hard driving taxi-driver ignored a red signal, threatened the traffic policeman's knees, missed the street island by a hair, and lightly grazed a bus, all in one dash.

The policeman hailed him, then strolled over to the taxi, pulling a big handkerchief from his pocket en route.

"Listen, cowboy!" he growled. "On yer way back I'll drop this and see if you can pick it up with yer teeth."

* * *

The *Illinois Technograph* says that many of our young engineers are spending a lot of time tinkering with the Misses in their motors.

* * *

Whenever we get to thinking that we're pretty good, and that a world without engineers would be a total loss, we think of this story from the N. Y. U. *Quadrang'e,* and it takes us down, far and fast.

In Montana a railway bridge had been destroyed by fire, and it was necessary to replace it. Two days later came the superintendent of the division. Alighting from his private car, he encountered the old master bridge builder.

"Bill", said the superintendent—and the words quivered with energy—"I want this job rushed. Every hour's delay costs the company money. Have you the engineer's plans for the new bridge?"

"I don't know", said the bridge builder, "whether the engineer has his picture drawed yet, but the bridge is up and the trains is passin' over it."

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Some Aspects of the Slum Clearance Problem

(*Continued from page fifty-eight*)

SIX STORY FIREPROOF ELEVATOR APARTMENTS

35% Coverage 100,000 square feet of Land Area
Average 185 square feet per room

Government buys the land and leases it to Housing Authority, which builds and government makes 45% grant of cash.

CAPITAL COST	
Land 100,000 square feet at $6.00	$ 600,000
Building (includin garchitects and builders fees) 2,345,000 cubic feet at 40¼c	944,000
Legal and Mortgage Expenses, and Interest during Construction	50,000
	$1,594,000
After Government buys land and grants 45% of remaining cost, the indebtedness against the enterprise is	$ 546,700
ANNUAL CHARGES	
Operating and Management 1135 rooms at $44.00	$ 49,940
Ground Rent 3% of 600,000	18,000
Interest and Amortization 546,700 at 4¼%	23,235
	$ 91,175
Vacancies and Bab Debts 5%	4,559
	$ 95,734
Required annual revenue per room to balance	$ 84.35
Required monthly rental per room	$ 7.03

Length of time required to retire indebtedness:

$$x = \frac{\log\left(\frac{\text{interest}}{\text{amortization}} + 1\right)}{\log\,(1 + \text{interest})}$$

$$x = \frac{\log\left(\frac{.03}{.0125} + 1\right)}{\log\,(1 + .03)} = \frac{\log 3.4}{\log 1.03} =$$

$$\frac{.53148}{.01284} = 41 \text{ years}$$

Observe that the required rental is $7.03 per room. Observe also that under this arrangement the city gets no taxes even on the land because it ingeniously provides that the government own the land and therefore both land and building are exempt from city taxes. If all goes well the government gets back 55% of the money spent on the building in 41 years, and owns a piece of land which at the end of that time may or may not be worth the amount paid for it and on which, in the meantime, no retirement of invested capital has taken place.

As far as Manhattan Island is concerned the sore spots which any slum clearance program should embrace are on the lower east side and in Harlem. As stated before such areas for large developments cannot be assembled for much lass than an average price of $10.00 per square foot. The reasons for this are many. A large part of it is mortgaged for an average of $9.00 a square foot. There are many small merchants whose sole source of income has been derived from their particular locations for 25 or 30 years and there must be a consideration covering the value land is administered by trustees of estates, is free and clear of their business as well as their real estate. Some of the under ownerships dating back many decades, and because they do not need the money and do not want to increase their income tax burden, are perfectly willing to retain the property indefinitely. Here and there are warehouses, garages, assembling plants, etc., which have long leases and the price paid must be the value of the real estate plus the capitalized value of the lease. Some pieces have had no clear title for many years; there may be 30 or 40 participating heirs some of whom may be in Italy or Algiers or China, each of which has to be satisfied, and this involves substantial legal and reaching fees. Others are in the hands of guardians of incompetents and minors who fear to sell at low prices lest they be accused of selling out their wards. Then there is the occasional chiseller who holds a key corner or a piece next to a corner who is out to get everything that his nuisance value permits.

Nevertheless $10.00 land is not hopeless for slum clearance if the idealists loosen up on their Utopian requirements. Below is a statement showing that under the existing PWA policy $10.00 land can be made to yield housing accommodations at $6.53 per room, at the same time clearing out the very worst of the slum areas, if buildings are twelve stories high with 45% coverage.

12 STORY & PENTHOUSE FIREPROOF ELEVATOR APARTMENT

45% Coverage 100,000 sq. ft. of Land Area
Average 185 square feet per room

CAPITAL COST	
Land 100,000 squar efeet at $10 per foot	$1,000,000
Building (Including architects and buiders fees) 5,940,000 cu. ft. at 46½c	2,762,000
Legal and mortgage expenses and interest during construction	100,000
	$3,862,000
After government buys land and grants 45% of the remaining cost, the indebtedness against the enterprise is	$1,574,100
ANNUAL CHARGES	
Operating and management: 3060 rooms at $43.00	$131,580
Ground rent 3% of $1,000,000	30,000
Interest and amortization 4¼% of $1,574,100	66,899
	$228,479
Vacancies and bad debts 5%	11,424
	$239,903
Required annual revenue per room to balance	$ 78.40
Required monthly rental per room	$ 6.53

The only completed real slum clearance project in New York City fostered by a government agency was Knickerbocker Village. It is twelve stories and penthouse high with a 47% coverage. It has all the light, air, comfort, and lack of congestion that one can desire and is one of the garden spots of the city. It has a higher density of population than the theoreticians like but let us quote from an editorial from one of the tenant newspapers:

> "We think our homes remarkably quiet and comfortable. We do not have the sardine feeling which the statistics might justify. This is due, we believe, to fairly well insulated walls and floors and the spaciousness of the garden courts in the center of each building."

Why all the hullabaloo about the price of land? If you will refer to the above figures you will arrive at the conclusion that if the land is $6.00 per foot instead of $10.00, the ground rent is $18,000 per year instead of $30,000 per year, and the rooms could rent for $6.20 per room instead of $6.53 per room. It is a decidedly minor factor compared with operating costs, construction costs and interest rates.

Referring again to the density of population, it might be pointed out that Knickerbocker Village, which is fully rented, actually has a density of 606 persons per gross acre. According to Bulletin 21 of the Regional Plan Association the most densely populated block in New York City is bounded by Catherine, Market, Madison and Henry Streets, two blocks away from Knickerbocker Village and had, according to the census of 1930 a population of 635 persons per gross acre. These persons were housed in dilapidated old law tenements four and five stories high. Taking the average number of people per family in the 386 families included in the Lavanburg Foundation report mentioned before, and multiplying by the number of tenements in the buildings replaced by Knickerbocker Village we arrive at a density of 780 people to the gross acre. It is a reasonable conclusion therefore that the new twelve story buildings have a lower density of population per acre than the four and five story buildings that they replaced.

One of the objects in restricting the density of population is to force more people into the outlying districts. This means an intensification of the transportation problem. The density of traffic on transit lines with all its by-products is almost as serious a social problem as the density of population. Long rides on subways and "els" twice a day during rush hours with people packed in like sardines are a tax on the strength of an individual, devitalizing him to a point where his efficiency is impaired, increase the spread of communicable diseases, expose

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young women to the unwelcome attentions of male strangers and provide ideal conditions for the depradations of pick-pockets.

There are thousands of poor people working in the business sections of Manhattan who like to walk to work. Manhattan residents in high buildings regard apartments on upper floors as more desirable and pay more rent for them. They do so because the air is purer and because they get further away from traffic noises that disturb their sleep. As long as a certain number of poor people have to live in Manhattan why not give a larger number of them these advantages?

The Wagner Housing Bill provides for an appropriation of $880,0000,000. Even though it is intended to use the interest and amortization to create a revolving fund for further development, the amount involved is only sufficient to scratch the surface of the slum clearance problem. It will have to face mounting construction costs and the increasingly acute problems of city taxation. In any event it will accomplish very little if the underlying factors and requirements are not flexible enough to be adjusted to the cold realties of economic facts.

—o—

CHI EPSILON INDUCTS SIX NEW MEMBERS

The following men were initiated into the ranks of Chi Epsilon, National Honorary Civil Engineering fraternity, on the evening of November 26: C. J. Rossow '36, H. H. Sturdy '36, J. T. Barton '37, L. A. Christensen '37, B. Rodriguez-Santos '37, and J. R. Wandling '37. President John McManus '36, conducted the ceremony in the North Room of Willard Straight Hall.

Following the initiation, the society held its semi-annual banquet. The main speaker for the evening was Dr. J. D. Burfoot, Jr., of the Geology Department, who spoke on the "Internal Structure of The Earth." The evening was concluded with a short talk by Professor Hollister, Director of the School of Civil Engineering, who described the new research projects about to be undertaken in the school and announced the purchase of a new high-pressure, hydraulic testing machine, to replace the present antiquated one.

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Cornell Books For Father '05
Life of Ezra Cornell by A. W. Smith.
Autobiography of Andrew D. White.
Poems by A. W. Smith.

Pipes and Tobacco
The Kind of Pipe that Suggests Tweeds, Dogs and Books.

Authentic Winter Sports Things
Skates, Skis, Ski Pants and Caps.

The 1936 *Cornell Calendar*
The Pictures Don't Give Cornell Any The Worst of it.

The Cornell Co-op
Opposite Willard Straight*

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Fine Wines, Liquors or Cordials
From our large assortment make very pleasing gifts. Come down and look them over.

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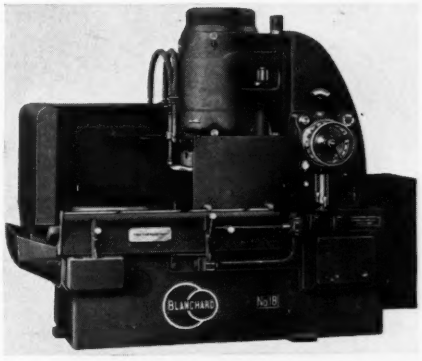
Highlights of the Machine Tool Show

(*Continued from page sixty-one*)

but he was particularly impressed with the boom which the industry received as a result of the show. The manufacturers of the machine tools found orders piling up, and some of the buyers found that they would have to wait as much as four months, in some cases, for delivery on their order. He had much to say on the new developments in turret lathes.

Mr. Roy, who visited the show with Professor Rogers, was interested in the show from an industrial viewpoint. He says that the machine tools of five to ten years ago are now obselete. They are made obselete because of the fact that competitors who use the new machine tools, will be able to sell his products cheaper, and in some cases they will be better products, than one who sticks to these old machines. This, according to Mr. Roy, is the main reason for the present increase in the business of the industry.

Devices for rapid loading of the machines, automatic size control, and automatic feeds were also of interest to Mr. Roy. On several machines, the operator was able to unload and reload the machine while another piece was being operated on. This makes it possible for the machine to be doing useful work continuously, rather than having it run idly while the operator changes the work in the machine. Mr. Roy also noticed that the machines seemed to have more power and greater rigidity, which, he said, are necessary in order to accommodate the higher speeds.



Courtesy Modern Machine Shop
BLANCHARD SURFACE GRINDERS

Both Professor Rogers and Mr. Roy were impressed by the extensive use of pressing to perform certain operations. Many operations which were formerly cast or machined are now done by this hydraulic pressing method. This eliminates much weight, and is found to be more economical.

By use of electrical methods, irregular shaped pieces

Time-Space Photo of the Ichthyormis on nest.

ORNITHOLOGY

ICHTHYORMIS ON NEST

Family Odontotormae, or separate toothers

Here, for the first time in history, we are able to show a photograph of this prehistoric bird. This was a tough assignment for our *Time-Space* camera man, but he came thru in his usual "snappy" manner.

Note the protective coloration on the eggs. The mother always used her own judgment in the matter of pattern. This old gal liked to have her eggs resemble pices of wall paper. Others preferred the more intricate playing-card designs. Later, these complicated embellishments were called Mid-Victorian, and the simpler designs came into style.

"Nothing like a good photograph to clear up the doubts which mights exist about the appearance of these ancient birds.'"

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are now easily machined. A tracer follows the outline of a template, and by the application of electromagnetism, controls the path of the tool to agree with the template. A machine which applies this method cuts production time considerably. One of these machines, produced by the Monarch Machine Tool Company, is pictured on the cover of this issue.

The automatic sizing devices also proved to be of interest to many visitors. In some machines making use of this, the piece is automatically loaded, finished to size, and ejected when the correct size has been attained.

The new machines seem to be safer for the operator. In many, the only exposed, moving part is the work itself. Gears are almost exclusively covered up. Speed changes and the rate of feed is often controlled by levers. In some of the machines panels are provided, on which are push-buttons for controlling operations. Several of the larger machines were controlled by a suspended panel which could be moved wherever the operator found it most convenient.

It seems logical that any trend toward greater business activity would be first sensed by the Machine Tool industry. If the present trend in this industry is any sign at all, we are rapidly coming out of the depression. However, this prosperity, which the machine tool manufacturers are at present enjoying, is due, to a considerable extent, as a reward for their diligent research during the recent dark years of the depression.

—o—

Stresses in Wash Siphons

(*Continued from page sixty*)

case of the All-American wash siphons.

As a concluding statement it might be pointed out that the solution obtained for this problem is obviously not an exact one in the sense that all the boundary conditions are satisfied for the actual structure. A more exact treatment would require that the shearing stress at the free edge should be zero and that in order for it to be so, the structure must curl up (or down) at the edges. However, since such curling would be prevented to a large extent by the dead weight of the structure the above solution is probably not far from the truth.

—o—

President's Column

(*Continued from page sixty-four*)

our College. They need not be burdensome but can be expressed in a perpetual interest to uncover matters that should be referred to the faculty, and expressed in suggesting possible sources of funds. Do not feel that someone else should do these things. Be one who does it!

Let us have your views and discussion. Communications should be addressed to The Cornell Society of Engineers, % The Cornell Club, 245 Madison Ave., New York, N. Y.

Sincerely yours,

—EDWARD C. M. STAHL

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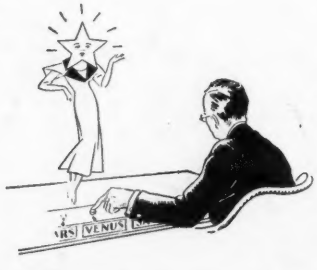
G-E *Campus News*

EDITORIAL BOUQUET

IT IS very pleasant to have people say nice things about one. The pleasure is curiously heightened, however, when the nice things are said in a roundabout way—never intended directly to reach one's ears. General Electric recently was honored in such a manner on the editorial page of the Spokane, Washington, *Chronicle*, and the Company is still basking in the warmth of the glow generated. The editorial, in part, read as follows:

"An exposition at which inventors of the Pacific Northwest will display their work will be held next month in Portland.

"It will probably be a revelation to those who see it. Most persons find it hard to think of great men coming from 'near at home.' When one speaks of inventors or scientists, the Northwest citizen thinks of the General Electric laboratories, or of observatories in California, or clinics in Vienna. . . ."



CELESTIAL PUSH-BUTTON CONTROL

HEAVENLY bodies a million times fainter than the faintest star the eye can see unaided will be brought to the earth for inspection and photography at the touch of an electric push button when the McDonald Observatory on Mt. Locke in western Texas is placed in operation. The observatory building itself is almost completed, but the technicians of the Warner and Swasey Company at Cleveland are "making haste slowly" with the polishing of the 82-inch reflecting mirror. They estimate that another 12 or 18 months will be needed before the mirror is ready for installation. The 45 tons of moving parts of the telescope will be at the command of a single individual, who will be able to take his stand upon an observing bridge and virtually order the stars to parade before him. The motors and complete electrical control to make this possible have been manufactured for the builders of the telescope by General Electric.

VOICES FROM THE SKY

WHEN the Whiteface Memorial Highway—a road leading to the summit of the 5000-foot Whiteface mountain in the heart of the Adirondacks—was dedicated this autumn, voices came down from the sky on a beam of light. There was nothing mystical about this performance, however. The beam of light came from a 24-inch G-E searchlight on the summit of the mountain. The voices were those of President Franklin Roosevelt and New York's Governor Herbert Lehman.

President Roosevelt's words, dedicating the highway, were carried on the light beam seven miles from the mountain to the crowd at the Lake Placid airport. Governor Lehman had spoken over the light beam the night before. He was so interested that, after the dedication ceremonies were finished, he spoke again to demonstrate the equipment to the members of his family. Both night and day demonstrations were successful, although once or twice during the day the words faded to faintness when small clouds floated by the mountain top and partially obscured the light beam.

Two-way communication was carried on by means of short-wave radio equipment located at the airport. G-E engineers, who made this special installation, had to transport a gas-driven power plant and a dozen or more storage batteries to the mountain top to operate the talking light beam.

96-205DH

GENERAL ELECTRIC